

THE N. C. AGRICULTURAL EXPERIMENT STATION WHAT IT HAS DONE IN THE PAST—WHAT IT PROPOSES TO DO IN THE FUTURE.

The North Carolina Agricultural Experiment Station was established by an Act of General Assembly in 1877, just ten years ago, which Act the same time established a Department of Agriculture and of Immigration and Statistics.

The objects for which the establishment of the Experiment Station were desired were two-fold:

1st. To protect the farmers of the State from the fraudulent fertilizers then flooding the market, to exercise a general control of the trade by a system of inspecting all brands legally on sale in the State, and by a chemical analysis of these samples to ascertain if their qualities were up to a certain guaranteed standard.

2nd. To carry on experiments in the field (in the language of the Code) "On the nutrition and growth of plants with a view to ascertain what fertilizers are best suited to the various crops of this State, and whether other crops may not be advantageously grown on its soil."

As to whether the Station has fulfilled the requirements in respect to the first, in the proper control of the fertilizer trade, the following statement will show.

1. Prior to 1887 no less than 125 brands of fertilizers were sold in the State, and of such a character that no confidence could be placed in them or their qualities. A good fertilizer producing excellent crops the first year might prove worthless the next. The farmers had absolutely no redress. On every hand fraudulent fertilizers were sold and no farmer could by any possible way tell whether three-fourths or nine-tenths was sand. The people had lost all confidence in their sale and at the time of the establishment of the Experiment Station scarcely 40,000 tons were sold annually, not from the fact that all fertilizers were made at home (would that it could be so!) but owing to the entire loss of confidence everyone had in the trade. What were the people to do—the use of fertilizers for plant food on most of our lands is as necessary to the growth of the crop as food is to a baby.

They must be used, there is no help for it, and yet the farmers of the year 1877 and before, were paying millions of dollars annually for sand to haul on the soil, in many instances already too sandy.

In fact a certain manufacturer sold many tons of a stuff containing common sand, which he claimed was as good as ammonia, and the farmers paid him 8 cents per pound for it, because they had no means for proving that it was valueless.

2. After the law went into force, 80 out of these 125 fertilizers were driven from the State, and the remainder were greatly improved in quality and have continued to improve ever since. The following extract from the Station's Report, for 1886, will give to our farmers some idea of the improvement of the fertilizers sold.

The average percent of available phosphoric acid has increased from \$7.40 in 1880 to \$8.69 in 1886; the average per cent. of potash has increased from \$1.30 in 1880 to \$2.30 in 1886, while the per cent. of ammonia remains remarkably near one figure for all the years except 1883, when ammoniates were unusually scarce. Thus the valuation of the average fertilizer, using the prices of 1886 for all analyses alike, has, with a few fluctuations, steadily climbed up from \$21.04 per ton in 1880 to \$24.52 per ton in 1885, and \$23.44 in 1886. The most remarkable thing is that during this period, 1880 to 1886, the actual cash prices paid by North Carolina farmers for these fertilizers has increased 25 per cent., while the quality or grade has improved 14 per cent. This means that North Carolina farmers could get, in 1886, for three millions of dollars what they had to pay four millions for in 1880—yes, and get an article one-seventh better than the 1880 article was.

3. The station has endeavored to extend information on all matters pertaining to scientific agriculture by printing numerous publications—over sixty separate reports, pamphlets, formulas for composts, tables of analyses of fertilizers, &c. 120,000 of these publications have been distributed broadcast throughout the State, and in addition the monthly Bulletin has largely increased this circulation. The effect of these publications has been of the greatest service to the people of the State, individually and collectively.

4. By the Station's urgent advice,

thousands of home-made composts have been made by farmers in every section of the State, and the farmers have learnt that every pound of compost put up means so much money in their pockets. To further aid in the work, these composts have been, when requested, analyzed by the Station. Over three hundred of these and other home materials, from waste products have been examined and their value to the farmer shown.

5. The phosphate beds of the State have been explored and mapped. These beds though not now worked on account of the existence of South Carolina rock, of higher grade will undoubtedly prove valuable in the future and thus be very profitable to the State.

6. The marls of the State have been examined and no less than three hundred beds analyzed. A stimulus has been given to use them, which will prove of incalculable value in materially improving the soil.

7. On account of the proper control and regulation of the sale of fertilizers, the acreage in cotton has been largely increased and the western limit of the cotton belt is now fifty miles farther westward than formerly. Tobacco has like-wise increased in acreage. Now where soils are worth for tobacco growing \$25.00 an acre then were worth less than \$5.00.

8. Frauds in the adulteration of fertilizers have been discovered and stopped. In 1881 adulterated nitrate soda containing 75 per cent. common salt was detected. In 1882 hair, leather, and horn were found mixed with ammoniated fertilizers. In 1883 adulterated kainite and Peruvian guano were exposed. In these and other instances were the farmers protected from various frauds and swindles.

9. As a further check upon the trade and in order to educate our farmers on this subject, the Experiment Station makes analyses of samples of fertilizers, chemicals, composts &c., for actual North Carolina Farmers, free of charge, provided the samples are taken and forwarded according to our directions.

10. The Station has stimulated home growth of industries in such a way that while in 1878 there was only one fertilizer factory in the State, now there are ten. Cotton Seed Oil Mills have increased in number from none in 1878 to 9 at present. Many waste products have been utilized in the manufacture of waste products for making standard fertilizers—for example, tobacco stems, cotton seed meal, refuse from fish factories, &c.

11. When the coal exploration was made by the Department of Agriculture in the Deep River and Dan River Sections the Station analyzed for this survey all the samples of coal obtained, and so, largely aided in this work.

12. Hundreds of mineral waters have been examined, and large numbers of ores identified and assured.

13. Seeds have been tested as to their purity and germinating qualities, and several adulterations detected.

14. Investigations have been made in the growth of the sugar beet and hundreds of analyses made from samples sent from every portion of the State.

15. The Station has made according to law all analyses for the State Board of Health, such analyses embracing many hundreds of portable waters, articles of food supposed to be adulterated and similar other articles.

16. The Station has made an exploration of the pyrite deposits, investigated every bed of importance, and analyzed samples of each. These deposits will at some future time be used for the manufacture of sulphuric acid largely used in the manufacture of acid phosphates. For this purpose Native Sulphur is now used, every pound of which is brought from Europe 4,000 miles away.

17. The officers of the Station have aided largely in the displays of the resources of the State in Boston in 1883, at our own Exposition in 1884, in New Orleans in 1885. These exhibits have done incalculable good in advertising North Carolina and her material resources.

18. The Station has always in the past and is to-day cheerfully and promptly attending to every request by mail and otherwise, in advising as to the proper treatment for certain soils, in giving a variety of formulas for composts suitable for each individual soil, and in fact in answering among others all questions relating to scientific agriculture.

19. The officers of the Station have attended many Farmers Institutes and made addresses relative to topics of importance to the farmers.

The money value of this work can-

not be estimated. As far as the fertilizers alone are concerned, the following will give an estimate—on an average 250 fertilizers are analyzed every year. A professional chemist charges for such work \$25.00 for each analysis, which would make \$6,250.00 for the work on fertilizers alone every year. Besides the fertilizers there are analyzed several hundred other samples each year, embracing among others, marls, soils, waters, phosphates, ores, cotton seed products, composts and agricultural products.

EXPERIMENTAL WORK.

And now as to the other duty of the Experiment Station to ascertain by experimental work in the field, the value of fertilizers on various crops, and other investigations to aid directly the farmer in his labors.

Not till the spring of 1886 did the Board of Agriculture see fit to establish a farm in conjunction with the work of the station and to carry out the provisions of the second part of the Act. True experimental work should consist mainly in actual field trials to be supplemented by the results obtained in the laboratory. One is necessary to the other as a man's right hand is to his left. Experimental work in the field should be combined with experimental work in laboratory. United they prove of the greatest benefit in advancing the general cause for which they should be undertaken; divided they are shorn of many of the advantages that would inevitably follow their union.

The work at the farm since its establishment has been to a large extent preparatory in its nature. A commencement has been made however, and with the proper facilities the work can be made of the greatest benefit to our farmers. In its workings they should take the liveliest interest, because for them it was established, and for their benefit the work is carried on.

The Experimental work that it would be best to undertake should it be considered entirely practical in character, and such as would give the most immediate and beneficial and practical results for the use of our farmers, it should include among others:

1. The effect of fertilizers on various soils and crops, carried on in conjunction with the Experiment Station by individual farmers throughout the State. With such a diversity of soil and climate as we have, this is a necessity to obtain results of value.

2. A study of the cultivation of our staple crops, looking to the improvement in the present system.

3. The best treatment of worn out lands to render them productive.

4. The best system for the rotation of crops, and the effect of time for the planting of each.

5. Experiments relative to the feeding value of the various forage crops, and of the grasses, now grown in the State, or can be grown, and to instruct our farmers in the value of the standard hays and grasses, of the nutritive value of each; and to determine from the analysis of the plants grown the proper ration for stock.

6. Investigation as to the growth of other crops than those now planted, to ascertain if more valuable crops could be substituted, in part or in whole, for those we now have. Such investigation, might include among others, the study of sorghum, the growth of root-crops, the growth of plants yielding fibre, a study of the various grasses of value, to ascertain how far the new crops could supersede the planting of cotton and other staple crops, now so exhaustive to the soil.

7. The construction of the silo, and the preservation of green forage crops, as ensilage, and comparative value of the latter with forage in the dry state.

8. Digestion experiments with stock to ascertain practically the value of certain of our food stuffs.

9. A study of the temperature of the soil, to ascertain how far it affects the growth of the crop.

10. Investigation of the chemical constituents of the standard crops in the various stages of their growth; and the growth of the roots of these crops, as determined by root-washing.

The above list might be largely increased. It is merely given to show in outline the work which is considered should be undertaken.

The results which have been accomplished by the experiment station in the past, as well as what it proposes for the future, is thus outlined. Can the people afford to let this work droop or languish—a work so fraught with good results?

H. B. BATTLE, Director.

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